

immediately. The President will receive the names of candidates and their testimonials of character on Tuesday, October 10, between 8 and 9 p.m. The examination will commence on Wednesday, October 11, at 9 a.m.

SCIENTIFIC SERIALS

Proceedings of the American Philosophical Society, vol. xix. No. 109, June to December, 1881.—Continuation of notes on an Egyptian element in the names of the Hebrew kings, &c., by S. P. Lesley.—Notes on the geology of West Virginia, by J. C. White.—Biotodynamic notes, III. and IV., by P. E. Chase.—On Alaskaites, a new member from the series of bismuth sulphates, by G. A. König.—The auriferous gravels of North Carolina, by H. M. Chance.—On some mammalia of the lowest eocene beds of New Mexico, by E. D. Cope.—Notes on the Quinneton coal group in Mercer Co. of West Virginia and Tazewell co. of Virginia, by J. J. Stevenson.—Notes on the coal-field near Cañon City, Colorado, by the same.—The brain of the cat (*Felis domestica*); I., Preliminary account of the gross anatomy, by B. G. Wilder.—Exploration of the River Bene with the hitherto unexplored regions of Bolivia, by E. R. Heath.—The names of the Gods in the Kiche myths, Central America, by D. G. Brenton.

The Transactions of the Academy of Sciences of St. Louis, vol. iv. No. 2, 1882.—The hieroglyphic tablet of Pompeii grammatically translated and commented on, by E. Seyffurth.—Notes on North American *Microgaster*s, with descriptions of new species, by C. V. Riley.—Descriptions of some new *Tortricida* (leaf-rollers), by the same.—On certain problems in refraction, by F. E. Nipher.—Magnetic determinations in Missouri during the summer of 1880, by the same.—“Reversion of type” in the diaphragm muscle of the human being, by C. A. Todd.—Epimeris of the satellites of Mars for the opposition of 1881, by H. S. Pritchett.—The genus *Isoetes* in North America, by E. Engelman.—Auroral phenomenon, September 12, 1881, by E. A. Engler.

Revue d'Anthropologie, Paris. Deuxieme, Fascicule (1882), contains:—A paper by Dr. Paul Broca—left incomplete at his death—on so-called Ectromelian monstrosities, or those in whom there is an abnormality, but not an absence, of certain parts of the body.—Contributions to the study of muscular variations in human races, by Théophile Chudzinski. This paper is one of a series, the earlier parts of which appeared in the *Revue* for 1873-1874, and which will be continued in subsequent numbers.—On the cephalometric square, and its mode of application, by Dr. Topinard, who also describes the respective merits and demerits of the methods usually employed by artists to determine the facial angle and its relation to other parts of the body.—On the populations of the peninsula of the Balkans, by the late French geographer and traveller, Guillaume Lejean, sometime vice-consul at Khartoum, and at Massauah. This portion of the author's exhaustive history of the origin and settlements of all the various peoples who have occupied the Hemus peninsula since it was held by the ancient Thracians, ends with the complete subjection, in the thirteenth century of the Slaves by Latin princes holding lands under the Greek Empire.—In a paper entitled “Les Griots,” Dr. Berenger-Féraud describes those itinerant musicians who are to be met with in every part of Central Africa, from the shores of the Atlantic to the Indian Ocean, and who, notwithstanding the low castes to which they belong, constitute a distinct confederation under the authority of a chief, who exercises great authority over its scattered members, and levies a heavy tax for his own use from their general receipts. These people, whose name of Griots is a French corruption of the Oulove word “Gwewonal,” are regarded with fear and repugnance by the negro natives of the lands which they traverse, and where they are looked upon as members of an impure caste, whose dead are capable of bringing sterility and perpetual drought to the ground in which they are buried. They are skilled in improvising and reciting; and while some play the violin and guitar, the least gifted among them beat the tam-tam or play on various discordant wind-instruments. The confederation is undoubtedly of long-standing, and while the Griots, who perpetuate many ancient myths and songs, contribute towards the maintenance of some degree of intercommunication among the African races, they are credited with fomenting frequent dissensions, by trafficking with the information which they acquire through the extraordinary license

granted them of going where they will among rich and poor, both in times of war and peace.—A critical review of all that is known of the Chukches, or Yu-its, by M. J. Deniker, gives the substance of what has been learnt of the ethnological and social standing of these Arctic peoples from the narratives of Nordqvist, Nordenskjöld, the Russian Argoustinovitch, Krause, Dall, and others.

Mathematische und Naturwissenschaftliche Mittheilungen, &c. (Berlin Academy), Heft 1, 1882.—Report of work in connection with the Humboldt foundation for natural research and travel, by E. Du Bois Reymond.—The thermo-dynamics of chemical processes, by H. Helmholtz.—On abnormal forms of pine-cones, by A. W. Eichler.—On the molecular refraction of liquid organic compounds, by H. Landolt.—The embryonal excretory apparatus of the gill-less *Hylodes martinicensis*, by E. Selenka.—On the differences of phase of electric vibrations, by A. Oberbeck.—On twisted rock-crystals, by E. Reusch.—On geognostic observations by G. Schweinfurth in the desert between Cairo and Suez, by E. Beyrich.—Investigation of volcanic rocks from the region of Abu-Zabel, on the Ismailia Canal, by E. Arzruni.—On the terminal growth of phanerogam roots, by S. Schwendener.—On an abundant exhalation of sulphuretted hydrogen in the Bay of Mesolungi, by G. Von Rath.—On transformations of amide by action of bromine in presence of alkalies, by A. W. Hofmann.—On the phosphates of thallium and lithium, by C. Rammelsberg.—The present state of science, by E. du Bois-Reymond.—On the production of amides of mono-basic acids of the aliphatic series, by A. W. Hofmann.—On the production of mustard-oils, by the same.—Crystallographic researches on sublimated titanite and amphibole, by A. Arzruni.—Congratulatory addresses to Von Bischoff and to Henle on attaining their doctor-jubilees.

THE last number of the *Journal* of the Russian Chemical and Physical Society (vol. xiv. fasc. 5) contains several valuable papers. Prof. Mendeleeff contributes an interesting paper “on the heat of combustion of hydrocarbons,” and a note on his experiments on the resistance opposed by water to the motion of solid bodies.—Prof. Butleroff contributes a notice on the important question as to the variability of atomic weights, and another on the oxidation of isodibutylene by permanganate of potassium; and M. Woeikof discusses the influence of local topographical conditions of meteorological stations on the average temperatures of winter.—Besides, we notice papers on the formation of hypochlorites and chlorates during the decomposition of chlorides by means of a current, by MM. Lyadoff and Tikhomiroff.—On the separation of barium from strontium and calcium by means of chromates, by M. Meschersky.—On the structure of nitrated products of the fat series, by M. Kisel.—On the critical state of bodies, by M. Stoletoff.—On the electrical conductivity of vacuum, by M. Kraewitsch.—On vibratory telephonic signals, by M. Jacoby.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, June 15.—“On a Deep Sea Electrical Thermometer.” By C. William Siemens, D.C.L., F.R.S.

In the Bakerian Lecture for 1871, delivered before the Royal Society (*Proc. Roy. Soc.*, vol. 19, p. 443), I showed that the principle of the variation of the electrical resistance of a conductor with the temperature might be applied to the construction of a thermometer, which would be of use in cases where a mercurial thermometer is not available.

The instrument I described has since been largely used as a pyrometer for determining the temperatures of hot blasts and smelting furnaces, and Prof. A. Weinhold (*Annalen der Physik und Chemie*, 1873, p. 225), using the instrument with a differential voltmeter described in my paper referred to, found its indications to agree very closely with those of an air thermometer within the limits of his experiments from 100° to 1000° C. I am not aware, however, that any results have been published of its application to measuring temperatures where a much greater degree of accuracy is required, as in the case of deep sea observations. My friend, Prof. Agassiz, of Cambridge, U.S., ordered last year, for the American Government, an instrument designed by me for this purpose, and during the autumn it was subjected to a series of tests on board the United States Coast and Geodetic Survey steamer *Blake*, by Commander Bartlett.

The apparatus consists essentially of a coil of silk-covered iron

wire .15 millim. diameter, and about 432 ohms resistance, attached to an insulated cable by which it can be lowered to the required depth, and connected so as to form one arm of a Wheatstone's bridge. The corresponding arm of the bridge is formed by a second coil made precisely similar to the former one and of equal resistance. This coil is immersed in a copper vessel filled with water, and the temperature of the water is adjusted by adding iced or hot water until the bridge is balanced. The temperature of the water in the vessel is then read by a mercurial thermometer, and this will also be the temperature of the resistance coil.

To avoid the error, which would be otherwise introduced by the leads of the resistance coil, the cable was constructed of a double core of insulated copper wire, protected by twisted galvanised steel wire. One of the copper cores was connected to each arm of the bridge, and the steel wire served as the return earth connection for both.

Sir W. Thomson's marine galvanometer with a mirror and scale was employed to determine the balance of the bridge.

Mr. J. E. Hilgard, assistant in charge of the United States Coast and Geodetic Survey, has sent me the results of Commander Bartlett's experiments. The apparatus was set up on board the *Blake* in April, 1881, and experiments were made off the east coast during August. In each series of experiments the temperatures at different depths were first taken by Miller-Casella thermometers attached to a sounding wire. A sinker was then fastened to the resistance coil, and it was lowered by the cable to the same depths, and the temperature read by means of the mercurial thermometer attached to the comparison coil. The depths at which readings were taken ranged from the surface down to 800 fathoms, and experiments were made both in rough and still water. The temperatures recorded varied from 38.5° to 81.5° F. In every case the readings of the electrical instrument were precisely the same as those of the Miller-Casella thermometers for the surface and the maximum depth; but for intermediate positions it was observed that the electrical thermometer in almost every case gave a slightly higher reading. This discrepancy may be accounted for, I think, by the circumstance that the electrical thermometer gives the temperature of the water actually surrounding the coil at the moment of observation, whereas the Miller-Casella instrument brings to the surface, or at least its readings are effected by, the maximum or minimum temperatures encountered in its ascent or descent, which may not coincide with that at the point of stoppage. This furnishes a very strong argument in favour of the superior accuracy of the electrical instrument.

It was found that about five minutes must be allowed at each observation for the resistance coil to assume the temperature of the water surrounding it, and a second period of five minutes for adjusting the temperature of the comparison coil on deck. Allowing five minutes more for lowering the cable, fifteen minutes sufficed to complete a deep sea observation.

Chemical Society, June 1.—Dr. Gilbert, president, in the chair.—The following papers were read:—Determination of nitric acid in soils, by R. Warrington. The sample should be taken in dry weather from the subsoil, as well as from the surface. It is dried at 55° C., and powdered. About 200 to 500 grms. are extracted in a vacuum filter with about 100 c.c. of water; the extraction requires ten to forty-five minutes. The nitric acid is determined by a modification of Schloëssing's method, the nitric oxide gas obtained being measured.—On a spectroscopic study of chlorophyll, by Dr. Russell and Mr. Lapraick. The authors have not endeavoured to isolate a pure substance, but have endeavoured to follow spectroscopically the changes of a body (or bodies) which gives a particular absorption spectrum. This chlorophyll was extracted by a mixture of alcohol and ether, and gives the well-known absorption spectrum of four bands easily seen, and three other bands in the violet end, which are not noticed with gaslight. This chlorophyll, by treatment either with a small quantity of almost any acid, or with some salts, as ferric chloride, mercuric chloride, &c., or by heat, is changed, and gives another characteristic spectrum, to which the authors gave the laboratory name of "half-acid" chlorophyll; by the action of strong hydrochloric acid, a further change is produced, and an absorption spectrum is obtained, which is named "acid" chlorophyll. Alkalies act on chlorophyll, and give eventually an absorption spectrum of one broad band in the red. Very concentrated caustic potash solution splits this band into two bands, one of which ultimately dis-

appears. The eye observations and measurements were checked with photographs taken by Capt. Abney. All leaves gave similar results, except some acid leaves, from the vine, &c., which gave half-acid chlorophyll instead of the normal product, when extracted with alcohol and ether.

Zoological Society, June 6.—Prof. W. H. Flower, F.R.S., president, in the chair.—The Secretary called the attention of the meeting to the curious way in which the young Cormorants lately hatched in the Gardens were fed by the parent birds, and exhibited a drawing by Mrs. Hugh Blackburn illustrating this subject.—A communication was read from Prof. St. George Mivart, F.R.S., containing a series of observations on certain points in the anatomy of the Cat-tribe (*Eluroidea*).—Mr. Howard Saunders read a paper on some *Laridæ* collected by Capt. H. H. Markham, R.N., on the coasts of Peru and Chili; comprising, amongst other rarities, the third known example of the large Fork-tailed Gull (*Xema furcatum*), a species which had been vainly sought for on the Pacific coast of America for upwards of thirty years. The author drew attention to the peculiarities distinguishing the various species of gulls found in the Pacific from those of the rest of the globe, and pointed out that, owing to oceanic currents, the connection between the species now only found on opposite sides of the equator had evidently been much more recent in the Pacific than in the Atlantic.—Prof. F. Jeffrey Bell read a paper containing an attempt to apply a method of formulation to the species of the *Comatulidæ*, and added the description of a new species, which he proposed to call *Actinometra annulata*.—Mr. Francis Day, F.Z.S., read some notes on the supposed identity of a specimen of a fish determined by Dr. Günther as *Anguilla kieneri* with a Gadoid *Lycodes*.—Mr. E. J. Miers read the second portion of his paper on the crustaceans received by the British Museum from the Mauritius, and called special attention to what appeared to be a variety of *Palinurus longimanus* of the West Indies which occurred in it.—Mr. W. A. Forbes read the fifth of his series of papers on the anatomy of Passerine birds. The present communication was devoted to the consideration of the structure of the genus *Orthonyx*, which was shown to be a true Oscinine form.—Mr. H. J. Elwes exhibited and made remarks on a Stonechat (*Saxicola*) which he had obtained during a recent expedition to the Aures Mountains of Algeria.—The Secretary exhibited a series of the diurnal and nocturnal lepidopterous insects bred in the Insect House in the Gardens during the present season.

Royal Horticultural Society, May 23.—Sir J. D. Hooker in the chair.—*Foliage injured by salt in the late gale.*—Dr. Church described experiments he had made at Cirencester during the last fifteen years to ascertain the amount of salt in the rain brought by autumnal gales, especially from the south-west. He found from 5 to 7 grs. per gallon, while the ordinary amount was only .5 grs. The average winter amount was but slightly in excess of the average summer quantity. He noticed that in Oakley Park, one side of the trees was severely injured, and that, if no rain followed for a few days after the gale, the salt sparkled on the trees, even at a distance of thirty-five miles from the sea. The salt abstracted the moisture from the leaf-cells, and formed a condensed solution, so that the leaf became completely dried up, and perished. Mr. McLachlan added that salt had been observed on windows at Lewisham, as at Croydon, and elsewhere. Sir J. D. Hooker remarked that Dalton was the first to record a similar observation at the beginning of this century. With regard to beeches withstanding the gale better than oaks, as mentioned at the last meeting, it was elicited that they were unhurt at Kew, and Valewood, Haslemere, but at Cirencester, in Dorsetshire, and Cornwall, they suffered severely. Mr. Blackmoor exhibited foliage of pears, &c., from Teddington, some of which was quite unhurt; of other trees growing adjacent to them, the leaves were much injured. Vines and peaches showed similar differences. He suggested that it could not be salt in this case. The opinion generally entertained was that such discrimination were due to the trees being of relatively hardy and less hardy kinds.—*Rhododendron triflorum*: Mr. Mangles exhibited sprays of this species from the Himalayas. It belongs to the scaly-leaved section, and he observed that members of this group will not hybridise with any species of rhododendron without scales on the foliage.—*Malformed tulip*: Mr. Smee exhibited a tulip having petals distributed down the peduncle, a not uncommon occurrence. Mr. Henslow remarked on the fact that when such a petal was half-green and half-coloured, the tendency of the

latter half is to check the growth and elongation of the peduncle. This causes the latter to bend over towards the side on which the petal is attached, and often so much so that it cracks on the opposite side, and may even decapitate itself.—*Change of sex in Rhododendrons*: The Rev. G. Henslow showed a flower in which the corolla was doubled, the stamens partially petaloid, while the pistil was open below with stamens, a tuft of imperfect petals and stamens arising from the base. He showed a drawing of a somewhat similar condition made in 1875, in which the style had become strap-shaped, was partially coloured red, and bore anther-cells on the margins; the pollen, however, was evidently abortive.

Entomological Society, June 7.—Mr. H. T. Stainton, F.R.S., president, in the chair.—Mr. P. B. Mason exhibited dark varieties of *Zygana filipendula*, and *Callimorpha dominula*, as well as of the insect formerly supposed to be *Agrotis helvetina*, Boisdu, but which was now believed to be a remarkable variety of *Noctua augur*.—The President remarked that there had been a great mortality this spring among the young larvæ of the currant saw-fly (*Nematus ribesii*).—Mr. McLachlan read a revised list of British *Trichoptera*.—Mr. W. L. Distant read descriptions of new species and a new genus of *Cicadidae* from Madagascar.—Mr. A. G. Butler communicated descriptions of heterocerous *Lepidoptera* collected in Chili by Mr. Edmonds: *Geometrites*.

Victoria (Philosophical) Institute, June 15.—Annual meeting; the Right Hon. the Earl of Shaftesbury, K.G., in the chair.—Prior to the delivery of an address on the scientific aspects of the last Palestine survey, by Mr. Trelawney Saunders—who gave a careful analysis of the valuable results of the survey of Palestine, especially noticing the accord of the results with the Bible narrative—the honorary secretary, Captain F. Petrie, read the report, from which it appeared that the total number of members was now upwards of 950, Prof. Pasteur and many other well-known men of science having joined the Society in the past year.

PARIS

Academy of Sciences, June 12.—M. Jamin in the chair.—The death of M. Conalia, Correspondent in Rural Economy, was commented upon.—On a point of the mathematical theory of effects in the game of billiards, by M. Resal.—Characters and rôle of double salts formed by fusion, by MM. Berthelot and Ilosvay.—Remarks on the use of zinc-carbon couples in electrolysis, by M. Berthelot.—Note on some explosive alloys of zinc and platinum-metals, by MM. Deville and Debray. Osmium is the only one of the platinum metals which does not retain zinc when one treats its alloy having a large excess of zinc, with an acid capable of dissolving this metal. The action of zinc on osmium-iridium is explained, according to laws of thermo-chemistry. (The heat liberated in union of zinc with iridium is enormous, and greatly exceeds that in union of osmium and iridium).—M. de Lesseps reported on the Suez Canal, and gave an account of the s.s. *Austral*.—M. Schloësing was elected Member in Rural Economy in room of the late M. Decaisne.—Programme of astronomical work to be done by the scientific expedition sent to the south pole, by M. Loewy. Classing the observations as (1) accidental, and (2) regular, those of the transit alone belong to the first; the second class include determination of the hour, the latitude and the longitude; of the radiant points of the southern heavens; and search for comets.—Observation of the Venus transit at Cape Horn, by M. Mouchez. The Transit Committee reluctantly gave up the island of Cape Horn for the mouth of the River Santa Cruz in Patagonia (for the most southerly station), the chances of good weather being so small; but they urge the importance of providing the Cape Horn scientific mission with instruments for transit observations.—Instructions for the naturalists of the Cape Horn Mission, for investigation of the animals on Terra del Fuego and adjacent islands, by M. Blanchard. *Inter alia*, the small mammals, as unable to cross wide arms of the sea, should throw light on questions in physical geography. Do the land birds migrate to the continent in winter? Are there batrachians in those parts? &c. Special means must be taken in those cold and wet climates for discovery of insects, few species of which attract notice by number or bright hues.—Instructions for the mission to Cape Horn, by M. Duchartre. In botany, special regard should be given to marine algae.—Geological instructions, by MM. Daubrée and Des Cloizeaux. Search for fossil debris and for earthy meteorites and masses of native iron is urged; also in-

vestigation of raised beaches.—Programme of meteorological and magnetic observations, by M. Angot. Direct observations to be made at 4 and 8 a.m. and p.m. at midday and at midnight, (the expedition has a complete series of registering apparatus, and for certain instruments, a double series). *Inter alia*, full instructions are given for observation of austral auroras.—Observations of planets 221, 222, 223, 224, and of Comet α 1882 (Wells) at Paris Observatory, by M. Bigourdan.—Observations of the same comet with the 7-inch meridian circle at Bordeaux Observatory, by M. Rayet.—Ditto with the 6-inch Brunner equatorial at Lyons, by M. Gonesiat.—On a mode of transformation of figures in space, by M. Venecek.—On the law according to which the electromotive force of a magneto-electric machine varies in function of the resistance of the exterior circuit, by M. Deprez. The diminution of electromotive force in the ring, when the current becomes very intense, is due to insufficiency of the inductors. The wires of the ring cut the magnetic lines of force at an angle increasingly different from a right angle (at which maximum force is had).—Oscillations of the plane of polarisation by the discharge of a battery; simultaneity of electrical and optical phenomena, by MM. Bichat and Blondlot. A Leyden jar was discharged through a coil round a transparent body (e.g. flint) between polariser and analyser, and each time there was reappearance of the extinguished light. In one arrangement the image of a slit in the polariser was viewed in a rotating mirror, with a telescope, at each discharge; and one saw a series of bright bands (as in the case of a spark). The plane of polarisation was proved to oscillate about its normal position.—Decomposition of salts by matters in fusion, by M. Ditté.—Action of heat on an acid solution of sulphate of nickel in presence of sulphuretted hydrogen, by M. Baubigny.—On the mechanism of putrid fermentation, and on the alkaloids resulting from it, by MM. Gautier and Etard.—On the decomposing action of certain organic matters on oxygenated water; *à propos* of a memoir by MM. Bert and Regnard, by M. Béchamp.—On the aptitude communicated to cold-blooded animals to contract charbon by raising their temperature, by M. Gibier. Charbon was communicated to frogs (five out of twenty) compelled to live, after inoculation, in water at 35° to 37°. The bacteria developed were longer than usual (due to slow circulation).—Does the mechanism of absorption of virus vary with the nature of the wounds? Does the nature of the wounds affect the efficiency of surgical intervention? by M. Rodet. The nature of the wound affects only the rapidity of the propagation, not at all the mechanism of absorption; the penetration is, in by far the most cases, by the lymphatic vessels, very rarely by the blood-vessels exclusively, and seldom, comparatively, by blood-vessels and lymphatics.—On the sub-basaltic alluvions of the Corions (Ardèche), by M. Torcapel.—Probable lowering of the current water in the valley of the Seine during the summer and autumn of 1882, by MM. Lemoine and de Préauveau.—M. Carré described a new fire-alarm; an iron wire, constantly stretched by a spring, and closing a circuit (with bell) when elongated by heat; communication is made by rupture, as well as by expansion of the wire.

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